European Scientific Journal December 2015 edition vol.11, No.34 ISSN: 1857 – 7881 (Print) e - ISSN 1857- 7431

THE ATTITUDE OF INFORMATION TECHNOLOGY STUDENTS IN MUTAH UNIVERSITY TOWARDS COMPUTERIZED EXAMS

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Abstract

The aim of this paper is to measure the attitude of Information Technology students in Mu'tah University towards computerized examination. In this study, we analyzed the following questions: Do students prefer computer based exams or paper based exam? Whatever their preference, why? What are the demographic factors that have affected the attitude of students towards computerized exams?

We discussed the security concerns that come to light when considering computerized exams, such as: How can we secure computerized exams? Therefore, the data utilized in this paper was collected from questionnaires which were designed to achieve the stated objectives as well as to encourage a high response rate. The design of the questionnaires used in this paper mirrored those found in online international journals. We also, reviewed previous literature about students' attitudes toward online tests. We obtained information about students' beliefs, attitudes, and feelings toward using computers in testing, adapting, and creating new items.

Keywords: Mu'tah University, Attitude, Information Technology, Online Testing

Introduction

1. Background of Study

Computer based education has become a popular subject in recent years. E-exam management is one of the most important building blocks of an e-learning environment. An electronic assessment system raises more security issues than other systems of an e-learning software. However, an e-exam scheme should achieve all the features that a traditional paper-based exam provides. In using an e-exam scheme, we expect that the electronic solution will decrease our duties as well as save costs and time. Therefore, since all security obligations must be completely fulfilled, its design should be specially focus on security.

Mu'tah University is one of the biggest universities in south Jordan. In recent years, there has been an increased interest in converting from paper-and-pencil tests to computer-based tests. As more organizations consider converting from paper-and-pencil tests to computer-based tests, the importance of such research into computerized tests has increased dramatically. This is because organizations must have at least a basic understanding of a computer and its vicissitudes. In addition, they must possess a knowledge of the psychometric properties of a computerized test to effectively use computer testing.

At Mu'tah University, the Language Center first used online test to conduct the University English Placement Test. This online test uses the University's intranet network. However, the Language Center is responsible for designing, planning, and administering the English Placement Test for all freshmen. They also teach the University's required Basic English Language Courses (BELCs) such as English, basic Arabic language, and computer skills.

According to the University rules, students have to take three multiple choice online exams in each language skill and computer skill courses. They include comprehension, structure and vocabulary, and Microsoft Office skills, even though these courses are not taught online.

At the end of each exam, students' grades should be inserted into an online database. Hence, the general identity of the student should be retrievable. This is managed with a time-release solution.

1.1 A SECURE ELECTRONIC EXAM

The online test in this study uses a program called Question Mark Perception. This program has the following characteristics. Firstly, it checks if the student has taken a test before. Secondly, if the student has not taken the test before, it sets a time limit for assessment and displays the time remaining. Thirdly, it allows the student to view his/her grade at the end of each exam and the total grades at the end of the final exam. Finally, it checks the student's name and number against Perception Security Database and updates the database with the student's grade. Many software test tools include the function of randomly selecting and presenting new questions. However, this minimizes the possibility of students in memorizing questions and answers. Software test packages not only make online tests easy to administer, they also reduce the time required to grade the tests.

Designers of online test programs are working hard to ensure the testing tools are secure.

All security obligations should be completely fulfilled. Hence, the design of online test tools should specially focus on security. Exams that require the student's physical presence does not only provide an opportunity to check the student's identity, but also ensures that the examinees comply with the exam rules (such as, students must not talk to one another, etc). In the case of long distance or virtual exams, achieving a legitimate operation requires special security concerns. The proposed electronic exam system assumes the existence of an examination center controlled by a supervisor, where all parts of the exam are performed electronically. This protocol is designed not only for multiple-choice tests, but also for essay tests.(huszti,peth,2010)

1.2 Security Requirements

Security requirements for an exam scheme are as follows:

Validity: Only eligible students' tests should be examined. Hence, the authority has to verify whether the sender is allowed to take the exam or not. Note that a student, after registration, can reveal his name to another student, asking her to take the test in his place. However, validity can prevent this form of exam malpractice. Students must be sure that they have received valid questions generated by the teachers of the university. It should be verified whether the exam grades were proposed by the teachers as well.

Secrecy: Exam questions must be kept secret till the time for the exam. During the examination, neither the questions nor the generated

answers are revealed. At the end of the exam, the grades must be published in such a way that only the corresponding student would know his mark.

Robustness: Exam questions cannot be altered or modified after submission.

Correctness: Students are not allowed to take the same exam more than once. Also, a submitted exam solution cannot be denied.

Receipt: After sending in the solution, students must be alerted to a successful submission.

1.3 Preparing the e-Exam:

The instructor prepares the exam and uploads it into his e-Learning account using a private password.

Every student has his/her username and password and has the freedom to download, run, and finish the exam within the time limit.

While answering the exam questions, the student can review or change his/her answers by using the next or back button.

When the student finishes the exam, or when the allotted time is exhausted, the grade will be displayed on the screen.

The student can review his\her answers and grades with their instructor. Although, this will not lead to a change in grades.

2. Statement of the Problem

We consider the problem of this research to be the following questions.

1. Is there any significant difference in IT students' attitudes towards computerized tests?

2. Do demographic factors (e.g., gender, achievement level, academic level) affect the students' attitudes towards e-Exams?

3. Are students afraid, nervous, or anxious during computerized tests?

4. What are the factors that affect the security of computerized tests?

3. Significance of the Study

This study can provide the reader with a good theoretical framework on the subject of study. Furthermore, this would assist the reader in determining the problems that plague students during an e-Exam as well as how their feelings affect their grades. Besides carrying out a survey about the opinions of students, this study suggests the best ways for students to adjust

to this kind of exam system. At the end of this study, necessary recommendations are provided to improve online test questions according to students' requirements.

4. The Instruments of the Study:

The researcher designed a written questionnaire and an interview sheet. The questionnaire was designed to achieve the stated objectives and to encourage a high response rate. The questionnaire was based on questionnaires found in international journals online and other studies.

As for the structured interview, it was used to supplement the data collected by the researcher. Aside from the fact that IT students were given the opportunity to freely express what they thought about certain points, they were also asked to respond orally to certain questions.

5. The Validity of the Instruments

Candidates from two business colleges were involved in pretesting the questionnaire. 8 prototypes of the questionnaire were distributed to 6 specialists. Only 3 of them responded. Following their response, some questions were dropped because it was assumed their response would not be easily given, while others were rephrased for better interpretation.

6. Reliability of the Instruments

The reliability of the questionnaire was found by distributing the questionnaires to 30 IT students who were not part of the sample. After this, in order to recognize the degree of clarity, the responses gotten from the questionnaires were computed using Crombach Alpha and was found to be .79 which is a suitable degree.

7. Data Analysis

The gathered data were statistically and descriptively analyzed. As for the statistical analysis, students responses to the questionnaires were computed and then analyzed using mean and standard deviation for the different dimensions of the questionnaire. In this study, SPSS (16) was used because it is readily available and easy to learn and understand. Furthermore, the methods employed include frequency distribution to identify the percentage response of the sample, regression to test the hypotheses, and the mean and standard deviation (STDEV).

8. Hypotheses:

The Main Hypothesis: There is no significant difference in IT students' attitudes towards computerized test at a level of significance of α=0.05.

Three hypothesis emerge from the main hypothesis. They are:

The First Hypothesis: There is no significant difference in IT students' attitudes towards computerized test at a level of significance of α=0.05 irrespective of their gender.

The Second Hypothesis: There is no significant difference in IT students' attitudes towards computerized test at a level of significance of α=0.05 irrespective of their academic level.

The Third Hypothesis: There is no significant difference in IT students' attitudes towards computerized test at the level of significance (α=0.05) irrespective of their academic achievement.

Although researchers have developed a number of tools to measure students' attitudes towards using computers in general, a few of them, especially those in the West, have developed scales to assess university students' attitudes toward online tests. Notwithstanding, no attempts have been made to develop such scales in the Arab world (Al-Ahmad, 2008). Therefore, the goal of this study was to develop a valid and reliable online test attitude scale for university students in the Arab world.

In order to create the items of the scale, the researcher collected his data from the following sources: Previous literature on students' attitudes towards computers; Students, eliciting information from them about their beliefs, attitudes, and feelings toward using computers in tests; and Adapting and creating new items.

The aim of this study is to develop an online exam system which is easily accessible by students from computers and other mobile devices. The study also carried out usability tests on both mobile and web based modules of the exams prepared using this system. The system developed within the framework of this study provides the users with an electronic environment that can be used easily, quickly, and effectively.

The overall objective of the system is to meet the demands of students and teachers with regards to efficiency, practicality, and effectiveness. Using this system, students can access exams by using their own mobile devices whenever they wish and wherever they are. Following the design and development phases, various usability tests were applied on

real users concerning the effectiveness and efficiency of the system as well as the user's satisfaction. The data obtained revealed that the online exam system and the exams prepared using this system were found to be effective, efficient, and useful (Tufekci, Ekinci, Kose, 2013).

In recent years, there has been an increased interest in changing from paper-and-pencil based tests to computer-based tests. As more organizations consider changing from paper-and-pencil tests to computer-based tests, the importance of such research on computerized tests increases dramatically. This article examines the research showing the equivalence of paper-and-pencil administered tests to computer administered tests, especially when the computer administered tests are exactly the same with paper-and-pencil tests. Four different categories of research on testing by computer were examined: previous reviews or research, standards and guidelines for computerized tests, individual research studies, and studies about computerized testing over time (Alan C., Bugbee Jr., 2014).

From this review, a number of general conclusions about testing by computer were reached: (a) It can be equivalent to a paper-and-pencil test, but it is the responsibility of the test developer to prove that it is; (b) This equivalence is established by meeting stringent criteria; (c) Computers affect testing; (d) Special considerations are necessary when computers are used for tests; and (e) Examinees must have at least a basic understanding of a computer and its vicissitudes as well as a knowledge of the psychometric properties of the test to be effective in the test.

Methodology and Procedures

Style of the Study

In this study, information on computerized tests was obtained in several ways, namely:

• Raw information from books and journals were collected. Although, some of these books were written by foreign authors.

•Some articles and case studies on the subject matter were obtained from the internet using search engines like Google, Yahoo, Ebseco etc. and also at http://www.eExaminations.org/

• The applied system in exam rooms or labs were observed while students were taking an e-Exam.

• Critical data were collected using a questionnaire. The questionnaire was designed to achieve the stated objectives and encourage a

high response rate and was based on questionnaires found in international journals online.

• Some information was gotten from interviews with several students before and after the e-Exam.

• Other data were obtained from personal experiences and historical data.

Methodology and Procedures

The study sample of 100 students included IT students at different levels of specialization in Mu'tah University. The study tool was distributed to all respondents, and 80 were retrieved, which is a convenient number for the purposes of the study. The Table 1 below shows the distribution of the sample by gender, academic level, and achievements level.

Table 1. The Properties of the Sample

Achievements / Levels	Excellent		Very Good		Good		Acceptable		Total
	M	F	M	F	M	F	M	F	
1st year	2	2	1	2	3	5	1	2	18
2 year	1	2	2	4	5	6	2	2	24
3 year	1	1	2	3	3	3	1	2	15
4 year	0	2	2	2	6	8	1	1	22
Total	11		18		39		12		80

The Description Tool (questionnaire)

It consisted of 27 items which measured students' attitudes towards computerized tests. Paragraphs 8, 10, 17, 18, 19, 20, 21, 22, and 25 measured the positive trends, while the remaining paragraphs measured the negative trends. The answers were given on a scale of 5 points according to the Likert classification: Strongly Disagree, Disagree, Okay, Agree, and Strongly Agree. The highest degree obtained by a respondent was 135, while the lowest degree was 27 with an average default of 81.

The researcher used the statistical tool, SPSS (16.0), to calculate the results. In the positive paragraphs, grades 5, 4, 3, 2, and 1 corresponded to Strongly Disagree, Disagree, Okay, Agree, and Strongly Agree respectively. In the same vein, in the negative paragraphs, grades 1, 2, 3, 4, and 5 correlated to Strongly Agree, Agree, Okay, Disagree, and Strongly Disagree. Table 2 shows this.

Table 2. The mean

Strongly Agree	Agree	Natural	Strongly Disagree	Disagree
1	2	3	4	5

Analysis Procedures

Arithmetic means and standard deviations were used to answer the question statement. Also, the first study and analysis of variance were used to answer the question statement. It was seen as a positive trend when the total degrees effector clauses were greater than the default middle scale which is 81. Furthermore, it was seen as a negative trend when it was less than 81. In other words, if the arithmetic mean is greater than 2.5, the trend is positive.

Results of the Study

Main Hypothesis

The study results relating to the presiding question, is there a significant difference in IT students' attitudes to computerized tests in Mu'tah University at a level of significance of $\alpha = 0.05$, was calculated. However, this calculation was done based on the total degree of each responder clause scale and then by the arithmetic mean of the total degree of all respondents. Where the mean was about 84, market trends were widely regarded as positive (since they are larger than the default average of 81). Shown in Table 3 are circles computational standard deviation responses of students to the measurement tool. The positive trends are weak and are approaching the negative trend.

Table 3. Means and STDV for the Main Hypothesis

Gender	Issue	Mean	STDV
Male	36	82	11.8
Female	44	86	6.5

First Hypothesis

Is there a significant difference in IT students' attitudes towards computerized tests in Mu'tah University at a level of significance of $\alpha = 0.05$ attributed to their gender?

The results of the One Way ANOVA analysis (Table 4) showed the presence of a statistically significant difference at the level of significance of $\alpha = 0.05$ in students' attitudes towards computerized tests due to gender [P = 0.002, f179 = 2.486]. The female students gave a more positive trend with an average of 86 compared to the average of 82 for males for the same instrument.

Table 4. The Test Result for the First Hypothesis

ANOVA

Sex

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	11.692	29	.403	2.486	.002
Within Groups	8.108	50	.162		
Total	19.800	79			

Second Hypothesis:

Are there significant differences at the level of significance ($0.05 = \alpha$) in specialization trends IT at the University of Mu'tah attributable to the academic year level?

In the results of one way ANOVA analysis (Table 5) and the lack of statistically significant differences at the level of $0.05 = \alpha$ in trends of students towards computerized testing due to the academic level of the student [F1 = 79,0.930, P = 0.57], there was no effect of the academic year level towards computerized test.

Table 5. The test result for second hypothesis

ANOVA

Academic year

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	22.975	29	.792	.930	.574
Within Groups	42.575	50	.852		
Total	65.550	79			

Third Hypothesis

Are there significant differences at the level of significance ($0.05 = \alpha$) in specialization trends IT at the University of Mu'tah attributable to the achievement level?

In the results of one way ANOVA analysis (Table 6) and the presence of statistically significant differences at the level of 0.05 = α in students' attitudes toward computerized test due to achievement level [F1=78, 2.655, P=0.001], the low level achievement (low grade) students have more positive trends than students with high grade.

Table 6.The test result for third hypothesis

ANOVA

Achievement

	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	42.331	33	1.283	2.655	.001
Within Groups	21.745	45	.483		
Total	64.076	78			

Table (7): Achievement level

Achievement level	Number	Mean	Standard deviation of
Excellent	11	53.8	14.0
Very good	18	59.9	15
Good	39	79.54	8.33
Acceptable	12	74.36	10.6

Conclusion

The final part of the study summarizes the research carried out, including the key finding and their implications. Thus, there are lots of recommendations which must be taken into considerations .

This study measures the direction of students of the IT department about computerized exams. Thus, this was done according to three demographic factors: sex, year (academic level), and academic Achievement.

It was clear from the results of the analysis that the female students have weak positive trends, but greater than male students' attitudes. The confidence of the female students in credibility exam and the method of their studies are deeper and more preserved than male students studying.

There are no indicators based on academic level. However, all the students at all 4 years freshman, sophomore, junior, and senior have the same attitudes towards computerized exam.

As for educational attainment, there are no indicators based on the academic achievement of students. Students with high scores do not tend toward computerized exam because they restrict the attainment of their knowledge in the course. Furthermore, they begin to experience creativity

and freedom while writing and answering paper exam to obtain high scores. Also, students with weakness achievement tend towards computerized test. This is because they do not engage in hard studying, and they have a lack of understanding of the material. As a result, they find computerized exam so easy to answer, especially multiple choice questions that needs no effort to answer. Some of them depend on chances in answering questions. Others transfer the answers of their colleague because the devices are close to each other in the exam room.

Furthermore, it turned out to analyze the results of the questionnaires that the majority of students, regardless of their previous demographic factors (sex, academic achievement, and academic level), feels completely comfortable and not afraid of computerized test. Thus, I believe that because of technology advancement in homes, schools, business etc, the dread and fear barrier no longer exists.

Consequently, the tension that the student may feel is the time counter declining which might baffle the students. As such, in the latest version of computerized exams, the counter time usually appears on the first page of the exam only.

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